

Chapter 5

1. Consider the utility function $U(x, y) = x^{1/3}y^{2/3}$.
 - (a) Solve for the demand functions, $x^*(P_x, P_y, I)$ and $y^*(P_x, P_y, I)$
 - (b) At the prices $P_x = 1, P_y = 1$, sketch the engel curve for x with $I = 3, 6$, and 9

2. Suppose that nearby Greeley, CO, following the example of Boulder, decides to impose its own sugary drink tax. They agree on a tax of 4 cents per ounce. Also suppose that demand for soda (a type of sugary drink) in Greeley can be expressed by the following demand function:

$$Q(P) = 20,000 - 500P$$

where P is the price of soda in **cents per ounce**.

- (a) Plot the demand curve for soda in Greeley, with Q on the horizontal axis and P on the vertical axis. Graphically show the area of the graph that represents consumer surplus **before** the tax is imposed for a price of 10 cents per ounce. What is the total consumer surplus (**in dollars**) for the soda market in Greeley?

- (b) Now suppose that the sugary drink tax takes effect. Assume that demand in Greeley will not impact the equilibrium market price for sugary drinks. In other words, Greeley residents must now pay a total price of 14 cents per ounce of soda (including the tax). What is the total consumer surplus (**in dollars**) for the soda market in Greeley **after** the tax takes effect?

- (c) How much consumer surplus (**in dollars**) is lost due to the imposition of the tax?